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| **RICHMOND HILL HIGH SCHOOL, Algebra 1 Common Core Curriculum Map**  **RESOURCES:**  Holt McDougal My.hrw.com, Glencoe’s classzone.com, Prentice Hall Workbook, Engageny.org, jmap.org | | | | |
| **STANDARDS OF MATHEMATICAL PRACTICES:** (All of the content presented in this course have connections to the standards for mathematical practices)  1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. | | | | |
| **UNIT #1: Relationships Between Quantities and Reasoning with Equations**  **CCS:** A-CED.3, A-CED.4, A-REI.1, A-REI.3, A-REI.5, A-REI.6, A-REI.10, A-REI.12  **Assessments:**  **Homework**: To be given daily on each introduced topic.  **Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.  **Formative Assessment:** Exit tickets, Questioning (Blooms), writing  **Weekly Quizzes**: Given every week to assess student learning  ***Materials:*** *White Board, Word Wall to display vocabulary*  ***Differentiation:*** *Small guided group, multiple level questioning, graphic organizers, Think-Write-Pair-share*  ***Technology:*** *Smartboard activities, calculator for basic calculations* | | | |  |
| **TOPICS/No. of days** | **OBJECTIVES** | **COMMON CORE STANDARDS** | **ESSENTIAL QUESTION** | **VOCABULARY** |
| **Algebraic Expressions—The Distributive Property (2 days)** | 1. Students use the structure of an expression to identify ways to rewrite it.  2. Students use the distributive property to prove equivalency of expressions | A-SSE.1, A-SSE .2  Interpret terms, factors, coefficients, and expressions (including complex linear and exponential expressions) in terms of context. | Can a rectangle have negative length? | Distributive property, Algebraic Expression, Numeric expression |
| **Algebraic Expressions—The Commutative and Associative Properties**  **(2 days)** | Students use the commutative and associative properties to recognize structure within expressions and to prove equivalency of expressions | A-SSE.1, A-SSE.2 Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2) 2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2). | How is an algebraic expression similar to an English expression? | Commutative, Associative |
| **Adding and Subtracting Polynomials (2days)** | 1. Students understand that the sum or difference of two polynomials produces another polynomial and relate polynomials to the system of integers  2. Students add and subtract polynomials. | A-APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and  multiplication; add, subtract, and multiply polynomials. | How is adding items in your closet similar to adding algebraic terms? | Monomial, binomial, trinomial, polynomial, terms |
| **Multiplying Polynomials**  **(2days)** | Students understand that the product of two polynomials produces another polynomial; students multiply  polynomials. | A-APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multipli-cation; add, subtract, and multiply polynomials. | How can we use a rectangle to multiply polynomials? | FOIL, rectangular method, |
| **PROJECT-** Foldables/Booklets on Polynomial Operations  **FORMATIVE ASSESSMENTS:**  Weekly Quizzes, Exit tickets  **SUMMATIVE ASSESSMENT:**  Mid-Module Assessment | | | | |
| **UNIT #2: Linear Relationships**  **CCSS** -A-CED.3, A-CED.4, A-REI.1, A-REI.3, A-REI.5, A-REI.6, A-REI.10, A-REI.12  **Assessments:**  **Homework**: To be given daily on each introduced topic.  **Class Discussion:** Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.  **Formative Assessment:** Exit tickets  **Weekly Assessment**: Given every week to assessment student learning  ***Materials:*** *White Board, Word Wall to demonstrate vocabulary*  *Small group instruction/guided group*  **Technology:** Ti-84, TNspire Graphing calculator;  Smartboard lesson activities | | | | |
| **True and False Equations**  (1day) | 1. Students understand that an equation is a statement of equality between two expressions. When values are substituted for the variables in an equation, the equation is either true or false.  2. Students find values to assign to the variables in equations that make the equations true statements. | A-REI.1 Explain each step in solving a simple equation as following from the equality of  numbers asserted at the previous step, starting from the assumption that the  original equation has a solution. Construct a viable argument to justify a  solution method.  A-REI.3 Solve linear equations and inequalities in one variable, including equations  with coefficients represented by letters | What must be true about the left side and right side of an equation? |  |
| **Solution Sets for Equations and Inequalities**  (3days**)** | 1. Students understand that an equation with variables is often viewed as a question asking for the set of values one can assign to the variables of the equation to make the equation a true statement. They see the equation as a “filter” that sifts through all numbers in the domain of the variables, sorting those numbers into two disjoint sets: the Solution Set and the set of numbers for which the equation is false.   Students understand the commutative, associate, and distributive properties as identities, e.g., equations whose solution sets are the set of all values in the domain of the variables. | A-REI.1  Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.  A-REI.3  Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | How can we use a graph to show solution sets? |  |
| **Solving Equations**  **(2days)** | Students are introduced to the formal process of solving an equation: starting from the assumption that the original equation has a solution. Students explain each step as following from the properties of equality. Students identify equations that have the same solution set. | A-REI.1  Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.  A-REI.3  Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | How do we determine that an equation will have a solution? |  |
| **Solving Equations with various outcomes**  **(1 day)** | Students use the properties of equality to solve equations. Students also explore methods that may result in an equation having more solutions than the original equation. | A-REI.1  Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.  A-REI.3  Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | What can we look for in an equation that will determine the type of solution the equation will have? |  |
| **Solving Inequalities**  **(2days)** | Students use the addition and multiplication properties of inequality to solve inequalities and graph the solution sets on the number line. | A-REI.3  Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | What kind of symbols do we look for in an inequality? |  |
| **Solution Sets of Two or More Equations (or Inequalities) Joined by “And” or “Or”**  **(1 day)** | Students describe the solution set of two equations (or inequalities) joined by either “and” or “or” and graph the solution set on the number line. | A-REI.3  Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | What do “AND” and “OR” mean in English? |  |
| **Solving and Graphing Inequalities Joined by “And” or “Or”**  **(1 day)** | Students solve two inequalities joined by “and” or “or,” then graph the solution set on the number line. | A-REI.3  Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. |  |  |
| **Factoring Polynomials**  **(use GCF ,DOTS, Trinomials a =1, Perfect Square Trinomials)**  (3days) | Students use various strategies to factor polynomials including reverse distributive property |  | How can we represent the dimensions of a rectangle, given the area? |  |
| **Solving Equations Involving Factored Expressions**  (2days) | 1. Students learn that equations of the form (𝑥−𝑎)(𝑥−𝑏)=0 have the same solution set as two equations joined by “or:” 𝑥−𝑎=0 or 𝑥−𝑏=0.  2. Students solve factored or easily factorable equations. | A-REI.3  Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | What can we say about a and b if ab = 0? |  |
| **Solve Equations Involving a Variable Expression in the Denominator. Determine when an equation is undefined.** (1day) | 1. Students interpret equations like 1𝑥 = 3 as two equations “1𝑥= 3” and “𝑥 ≠ 0” joined by “and.”  2. Students find the solution set for this new system of equations. | A-REI.3  Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | What is the difference between having 0 as a numerator and 0 as a denominator? |  |
| **Rearranging Formulas**  (1 day) | Students think of some of the letters in a formula as constants in order to define a relationship between two or more quantities, where one is in terms of another, for example holding V in V = IR as constant, and finding R in terms of I. | A-CED.4  Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law 𝑉 = 𝐼𝑅 to highlight resistance 𝑅.  A-REI.10  Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). | What can of formula can we get if we solve for L in P = 2L + 2W? |  |
| **Solution Sets to Equations and Inequalities with Two Variables**  (2days)  (Use Foldables or Booklet to  Reinforce skills) | 1.Students recognize and identify solutions to two-variable equations. They represent the solution set  graphically. They create two variable equations to represent a situation. They understand that the graph of the line is a visual representation of the solution set to the equation . | A-REI.10  Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).  A-REI.12  Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. |  |  |
| **Slope formula, Rate of Change, Graphing y-intercept, Writing an equation of a line** | 1. Students use the x and y intercepts to graph lines. They find rates of change and slopes.  2. Students relate a constant rate of change to the slope of a line. |  |  |  |
| **Slopes of Parallel and Perpendicular lines** |  |  |  |  |
| **Summative Assessment:**  Final Exams, Portfolio Assessments, End of term Reflection |  |  |  |  |
| **Solution Sets to Simultaneous Equations** | Solve a system of two linear equations graphically | A-CED.3  Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different |  |  |
| **Solution Sets to Simultaneous Equations**  (Use foldables or Booklet to reinforce skills) | 1. Students create systems of equations that have the same solution set as a given system.  2. Students understand that adding a multiple of one equation to another creates a new system of two linear  equations with the same solution set as the original system. This property provides a justification for a method  to solve a system of two linear equations algebraically. | A-CED.3  Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.  A-REI.5  Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. |  |  |
| **Solution Sets to Simultaneous Inequalities** | 1. Students create systems of inequalities that have the same solution set as a given system.  2. Students understand that adding a multiple of one inequality to another creates a new system of two linear  inequalities with the same solution set as the original system. | A-CED.3  Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.  A-REI.5  Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. |  |  |
| **Applications of Systems of Equations and Inequalities** | Students use systems of equations or inequalities to solve contextual problems and interpret solutions within a particular context. | A-CED.3  Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.  A-REI.5  Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. |  |  |